

## CLAIMS

1. A digital QP detecting apparatus that detects an input signal and outputs a detection signal, comprising:
  - a register that records an input digital data;
  - a first multiplier that multiplies the digital data recorded in said register by a first coefficient, and outputs the product;
  - a second multiplier that multiplies the digital data recorded in said register by a second coefficient, and outputs the product;
  - an adder that adds the input signal and the output from said first multiplier to each other;
  - a level comparing means that compares the level of the input signal and the level of the detection signal with each other; and
  - a first switch that switches the digital data fed to said register between an output from said adder and the output from said second multiplier based on a comparison result by said level comparing means,wherein the detection signal is generated based on an output from said first switch.
2. The digital QP detecting apparatus according to claim 1, comprising a third multiplier that generates the detection signal by multiplying the output from said first switch by a third coefficient.
3. The digital QP detecting apparatus according to claim 2, wherein the third coefficient is obtained by subtracting the first coefficient from 1.
4. The digital QP detecting apparatus according to any one of claims 1

to 3 wherein:

said first switch:

(i) selects the output from said adder as the digital data fed to said register if the level of the input signal is higher than the level of the detection signal; and

(ii) selects the output from said second multiplier as the digital data fed to said register if the level of the input signal is lower than the level of the detection signal.

5. The digital QP detecting apparatus according to any one of claims 1 to 4 comprising:

a latch that records a signal based on the output from said first switch, and updates the recorded signal at a predetermined period; and

a second switch that switches the reciprocal of the said predetermined period between the data rate of the input signal and a rate smaller than the data rate of the input signal based on the comparison result by said level comparing means.

6. The digital QP detecting apparatus according to claim 5, wherein:

said second switch:

(i) sets the reciprocal of the predetermined period to the data rate of the input signal if the level of the input signal is higher than the level of the detection signal; and

(ii) sets the reciprocal of the predetermined period to the rate smaller than the data rate of the input signal if the level of the input signal is less than the level of the detection signal.

7. A spectrum analyzer comprising the digital QP detecting apparatus according to any one of claims 1 to 6.

8. A spectrum analyzer comprising:  
an electric power signal converting means that converts a signal to be measured to an electric power signal;  
the digital QP detecting apparatus according to any one of claims 1 to 6 that detects the electric power signal and outputs a detection signal; and  
an extreme value detecting means that detects an extreme value of the detection signal.

9. A digital QP detecting method of detecting an input signal and outputting a detection signal, comprising:  
a recording step of recording an input digital data;  
a first multiplying step of multiplying the digital data recorded in said recording step by a first coefficient, and outputting the product;  
a second multiplying step of multiplying the digital data recorded in said recording step by a second coefficient, and outputting the product;  
an adding step of adding the input signal and the output from said first multiplying step to each other;  
a level comparing step of comparing the level of the input signal and the level of the detection signal with each other; and  
a switching step of switching the digital data recorded in said recording step between an output from said adding step and the output from said second multiplying step based on a comparison result by said level comparing step,  
wherein the detection signal is generated based on an output from

said switching step.